REMARKS

Claims 1-23 are pending in this application, with claims 1, 7, 11, 17 and 21-23 being independent. Claims 1, 7, 11, 17, 18 and 21-23 have been amended. Favorable reconsideration and allowance are respectfully requested.

The Office Action objected to the drawings as failing to comply with 37 CFR 1.84(p)(5), because they do not include in Fig. 5 a reference number "16" mentioned in line 14 of page 3 of the specification. The mention of that reference number 16 was an inadvertent error, which Applicants have corrected by deleting it. Applicants believe that this amendment effectively addresses the drawing objection, and respectfully request the Examiner to remove it.

The Office Action objected to claim 1 as including an unnecessary repetition. Without conceding the propriety of this objection, Applicants have amended claim 1 in the manner required by the Examiner, and respectfully request that the claim 1 objection be removed.

The Office Action, rejected claims 1-4, 7-14, 17 and 20-23 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,484,202 B1 to LeDuc, and rejected claims 5, 6, 15, 16 and 18 under 35 U.S.C. § 103(a) as obvious from LeDuc in view of U.S. Patent No. 6,564,341 B1 to Sundaram. These rejections are respectfully traversed.

As recited in independent claim 1, the present invention relates to an apparatus for detecting whether status information sent from a router (referred to as a "first router" in the parlance of the claim) is unreliable. The apparatus includes a processor which receives a first signal indicative of the status of communication between the first router and a second router, and compares the first signal with a second signal stored in memory and indicative of the status

of communication between the second router and the first. In accordance with a salient aspect of the present invention, the processor issues an alarm signal if the comparison reveals that the messages corresponding to the first and second signals are inconsistent.

Independent claim 7 relates to an apparatus for detecting false router updates issued from a compromised router. Independent claim 11 relates to a method of detecting whether status information sent from a router is unreliable. Independent claim 17 relates to a method of detecting false routing updates from a compromised router. Independent claim 21 relates to a storage medium containing computer code, for effecting a method for detecting whether router status information is unreliable. Independent claim 22 relates to a storage medium containing computer code, for effecting a method for detecting false routing updates. Independent claim 23 relates to an apparatus for detecting whether router status information is unreliable, with the claim elements written in means plus function form. All of these independent claims recite the salient feature discussed above, namely the issuance of an alarm signal if two pieces of communication status information are inconsistent.

It is known to employ link state routing as a means of distributing routing information through a network, to enhance traffic management. In link-state routing, each router is required to issue a router status message that identifies the router that is reporting the information, and lists all the neighboring routers for the report. Networks, however, can be attacked or degraded in ways that cause routers to become compromised, and give out false information.

The present invention guards a network against an unreliable, degraded or compromised router, by comparing a first signal from a first router indicating a connection status between the first router and a second router, with a second signal from the second router indicating a connection status between the second router and the first router, and issuing an alarm signal if the two signals are inconsistent. In this manner, the invention provides a greatly improved level of network security against attacks, since an intruder to be effective must subvert two or more network nodes within a very short time span, which is of course much more difficult than subverting a single node.

LeDuc relates to a method for determining the status of a transmission link between a first port and a second port. In LeDuc, each of the first port and the second port separately determines its status, in accordance with the process outlined in flowchart 400 of LeDuc's Fig. 4. In accordance with the process, it is determined whether each port is out-of-service manual, out-of-service automatic, testing, has a facility problem or is in-service. The status information is reported by each port to a management device, in the form of the byte depicted in LeDuc's Fig. 2.

The management device conducts an OR operation on the bits of the first port's byte with the corresponding bits of the second port's byte, to define the status of the transmission link between the two ports. Alarms can be sent based upon that defined status, such as for example sending an alarm if the link is determined to be out-of-service.

But the ORing operation performed in LeDuc is fundamentally different than the comparison carried out in the present invention. More particularly, LeDuc's ORing operation is

not looking for inconsistencies at all, but is rather looking to see if either of two status bits corresponding to a given condition (i.e., out-of-service manual, out-of-service automatic, testing, etc.) is set. If either is set, the management device determines that the given condition for the transmission link exists. The OR operation is not concerned with whether the bits are different; its only concern is whether at least one of them is true.

The present invention, in start contrast, is not concerned so much with determining the status of a transmission link, but is rather concerned with determining whether a router has been compromised. Towards that end, in the present invention, a comparison is made to determine if there are inconsistencies between two signals or messages. If an inconsistency is determined, an alarm signal is issued. In this fashion, the present invention is able to determine when a router becomes unreliable, and much greater level of network security is achieved.

Because this important feature is neither taught nor suggested by LeDuc, Applicants respectfully submit that it cannot possibly anticipate the independent claims, and respectfully request the Examiner to remove the Section 102 rejection.

Sundaram relates to a system that enables carrier-grade network fault monitoring in an unreliable transport environment. The Office Action cites Sundaram for its teachings regarding conventional fault monitoring and importing functions. The Office Action does not contend that Sundaram teaches or suggests, and Sundaram in fact does not teach or suggest, the features of the present invention discussed above. Accordingly, Applicants respectfully submit that Sundaram does not correct the deficiencies at LeDuc, and does not render obvious any of independent claims 1, 7, 11, 17 and 21-23.

The remaining claims all depend from one of independent claims 1, 7, 11, 17, and 21-23 and each partakes in the novelty and non-obviousness of its respective base claims. The dependent claims also recite additional patentable features of the present invention, and individual reconsideration and allowance of each are respectfully requested.

PATENT
Attorney Docket No. 99-442
Application Serial No. 09/533,467

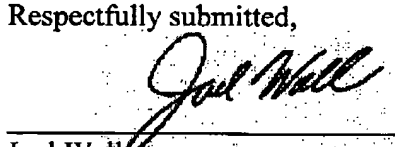
CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and passage to issue of the present application.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit

Account No. 07-2347. If an extension of time under 37 C.F.R. § 1.136 not accounted for above is required, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,



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